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From Pierre.Uhrich@obspm.fr Mon Jul 24 07:37:13 EDT 2000
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 <01JS5BADSETS00UYYU@MESIOB.OBSPM.FR>; Mon, 24 Jul 2000 13:40:42 +0200
Date: Mon, 24 Jul 2000 13:33:54 +0200
From: Pierre Uhrich
Subject: GPS RINEX data in the BNM-LPTF.
To: "BIPM, G. Petit" , "BIPM, Z. Jiang" ,
        "BIPM, P. Moussay" ,
        "CNES, M. Brunet" ,
        "CNES, J-L. Issler" ,
        "CNES, J-P. Berthias" ,
        "CNES, F. Mercier" ,
        "CRL, M. Imae" , "IEN, P. Tavella" ,
        "IEN, F. Cordara" ,
        "IERS, P. Gambis" ,
        "IGN, P. Willis" ,
        "IGN, M. Feissel" ,
        "NIST, T. Parker" ,
        "NIST, M. Weiss" ,
        "NIST, J. Levine" ,
        "NPL, J. Laverty" ,
        "NPL, J. Clarke" ,
        "NRC, J-S. Boulanger" ,
        "OFFMET, L. Prost" ,
        "OFFMET, G. Dudle" ,
        "ORB, P. Paquet" ,
        "ORB, P. Defraigne" ,
        "ORB, C. Bruyninx" ,
        "ORB, R. Warnant" ,
        "PTB, A. Bauch" ,
        "PTB, P. Hetzel" ,
        "SP, K. Jaldehag" ,
        "UNIBE, T. Schildknecht" ,
        "UNIBE, T. Springer" ,
        "USNO, J. Ray" ,
        "VSL, G. DeJong"
Cc: "BNM-LPTF, M. Granveaud" ,
        "BNM-LPTF, F. Taris" ,
        "BNM-LPTF, R. Tourde" ,
        "BNM-LPTF, D. Valat" ,
        "BNM-LPTF, A. Campos" ,
        "BNM-LPTF, A. Makdissi" ,
        "CNRS-LHA, R. Barillet" ,
        "CNRS-LHA, F. Hamouda"
Message-id: <397C29A2.F8A3FE06@obspm.fr>
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X-Mailer: Mozilla 4.7 [fr] (WinNT; I)
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Dear Colleagues,

This message is being sent to let you know about the GPS RINEX data
files collected in the BNM-LPTF at Paris Observatory. You will find here
joined a text file describing shortly the local installation in the
BNM-LPTF, and the way to access to the GPS RINEX files.

Please feel free to forward this message to anybody you might find
interested.

Any comments are welcome.
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Sincerely.
P. Uhrich.
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[Word file "GPS RINEX files.doc" converted to text:]

1. Local installation in the BNM-LPTF.

The equipment currently used in the BNM-LPTF at Paris Observatory (OP) for the collection of GPS carrier phase data is a 12 channel GPS receiver model Z12-T made by Ashtech. The other parts of the local installation are a cable between the main unit and the antenna exhibiting a low sensitivity to temperature, and a Temperature Stabilized Antenna, model TSA-100 made by 3S Navigation.

There is not any more any oscillator inside the receiver main unit. The external frequency sources are a 20 MHz signal and a 1 pps signal. Following a hardware design, these two signals have to be made phase coherent depending on some internal configuration. This has to be checked each time the frequency source is changed.

The current source for these signals is one H-maser located in the basement of the OP building in an air-conditioned room. This H-maser, made by SigmaTau (Datum), was delivered to the BNM-LPTF at the end of the year 1999. It is currently exhibiting a drift of about 3 x 10-15 / d, which is still decreasing with time. The 5 MHz and the 10 MHz signals coming from this H-maser are distributed in the operational room where the receiver main unit is located. This operational room is partially temperature controlled, in order to decrease the temperature during the hot season. The 20 MHz signal is generated by a locally built 2 x multiplier at the input of the main unit. The 1 pps is built up from the H-maser 5 MHz signal through a digital clock. Because the goal is to perform frequency comparisons, it is expected that the chosen H-maser is the one used to evaluate the BNM-LPTF Primary Frequency Standards.

The cable length between the main unit inside and the antenna outside is about 25 m, from which only a short length of a few meters is outside the building, but partially protected under a concrete structure before reaching the antenna location.

The TSA is firmly attached to a concrete structure on the roof of the same building. This will prevent as far as possible any large movement of it. The phase center coordinates, as computed with the help of the Time Section of the BIPM (we acknowledge G. Petit and Z. Jiang), are :

X = 4 202 778.0240 m
Y = 171 367.6047 m
Z = 4 778 660.5107 m.

One of the critical points of this implementation is a large mask due to another higher building, limiting the visibility of the satellites inside a few degrees of azimuth West/North-West, and potentially generating multipaths. Nevertheless, it is expected from this implementation a stability of the GPS equipments at the level of 2 – 3 ps between 30 s and one day averaging periods [1].

[1] Petit G., Thomas C., Jiang Z., Uhrich P., Taris F., Use of geodetic GPS Ashtech Z12-T receiver for accurate time and frequency comparisons, IEEE Trans. On Ultrasonics, Ferroelec. And Frequ. Contr., Vol. 46, n°4, July 1999, 941-949.

2. The GPS RINEX files in the BNM-LPTF at OP.

The GPS Ashtech files are collected on a daily basis, by an automatic downloading into the laboratory main system just after midnight. These files are then automatically transformed into RINEX files, and put in a directory that can be reached by two different ways.

ftp download.
ftp connection: opdaf1.obspm.fr
user name: anonymous
password: your e-mail
directory: Z12:[RINEX]

http download:
http connection : http://opdaf1.obspm.fr/z12/rinex

The files available there are of the following type :

ABCD1234.12A

Where:
ABCD stands as the location name, currently only ABCD = LPTF,

123 are indicating the day of the year (doy), from doy = 1 to doy = 365,

4 indicates the number of session files created that particular day. The figure 1 indicates one single session over the whole day, which is the nominal situation. But it could happen that there will be more than one session, generated by any event inside the laboratory. Any digit different from 1 will nearly all the time indicate that some of the 30 s sampled data were lost that particular day.

.12 are giving the last two digits of the year.

A a letter characterizing the data file:
O means observation RINEX file,
S means satellite configuration file.

As an example, the observation data file collected in the BNM-LPTF on February 21 of the year 2000, one single session during that day, will be referred to as:

LPTF0521.00O

The current plan is to update the files automatically on a daily basis, but to keep available at least the last full month of RINEX data inside the directory.